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In the Supreme Court of the United States

OCTOBER TERM, 1974

No. 73-1708

KEVIN J. BURNS,

Appellant,

vs.

LINDA ALCALA, individually and on behalf of all other persons similarly situated,

Appellees.

On Appeal from the United States Court of Appeals for the Eighth Circuit

Motion for Leave to File Brief Amici Curiae and Brief as Amici Curiae in Support of Appellees of American Association for Maternal and Child Health, Childrens' Foundation, and Food Advocates

GEORGE R. MOSCONE
HANSON, BRIDGETT, MARCUS & JENKINS
One Kearney Street
San Francisco, California 94108
Telephone (415) 781-5500

ROBERT M. TEETS, JR.
FOOD ADVOCATES
2288 Fulton Street
Berkeley, California 94704
Telephone (415) 642-4911

Of Counsel
AUDREY TEETS CROSS

BORK PRINTING COMPANY OF CALIFORNIA, 549 FIRST STREET, SAN FRANCISCO 94105

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RULES OF THE SUPREME COURT OF THE UNITED STATES

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SOCIOECONOMIC, MEDICAL, AND NUTRITIONAL AUTHORITIES

Antonov, A. N., (1947), "Children Born During the Siege of Leningrad in 1942", *Journal of Pediatrics* 30:250 ..... 14, 16

Balfour, M. J., (1944), "Supplementary Feeding in Pregnancy", *Lancet* 1:208 17

Bell, W., *Aid to Dependent Children*, (Columbia University Press, 1965) 6

Birch, H. G., (1971), "Functional Effects of Fetal Malnutrition", *Hospital Practice* 134:147 15

Burke, B. S., V. A. Beal, S. B. Kirkwood, and H. C. Stuart, (1943), "The Influence of Nutrition Upon the Condition of the Infant at Birth", *Journal of Nutrition* 26:569 9

Burke, B. S., V. A. Beal, S. B. Kirkwood, and H. C. Stuart, (1943), "Nutrition Studies During Pregnancy", *American Journal of Obstetrics and Gynecology* 46:38 9

Butler, N., (1974), "Late Postnatal Consequences of Fetal Malnutrition", *Nutrition and Fetal Development*, (M. Winick, editor) 15

Pages

Caldwell, D. F., and J. A. Churchill, (1967), "Learning Ability in the Progeny of Rats Administered a Profein-Deficient Diet During the Second Half of Gestation", *Neurology* 17:95 11

California Medicine, "Principle Causes of Maternal Mortality, 1957-1962", (1964), 100:412 20

California State Assembly Committee on Health and Welfare, *Malnutrition: One Key to the Poverty Cycle*, January 12, 1970 25

California State Senate Health and Welfare Committee, Subcommittee on Nutrition and Human Needs, "*Hearings: AFDC Grant Cuts to Pregnant Women*", October 4, 10, 26, and November 29, 1972 23

Cameron, C. S., and S. Graham, (1944), "Antenatal Diet and Its Influence on Stillbirths and Prematurity", *Glascow Medical Journal* 24:1 16

Cautley, E., (1940), "Simple Infantile Anemia", *Clinical Journal* (London) 36:325 18

Chow, B. F., and R. W. Sherwin, (1965), "Fetal Parasitism?", *Archieves of Environmental Health* 10:395 10

Chow, B. F., (1973), "Testimony on Maternal, Fetal, and Infant Nutrition", *Hearings Before the Select Committee on Nutrition and Human Needs*, U.S. Senate, (Part 1—The Consequences of Malnutrition) 10

Cowley, J. J., and R. D. Griesel, (1966), "The Effect on Growth and Behavior of Rehabilitating First and Second Generation Low Protein Rats", *Animal Behavior* 14:506 11

Cravioto, J., L. Hambreaus, and B. Vahlquist (editors), (1974), *Early Malnutrition and Mental Development*, (Swedish Nutrition Foundation) 16

Pages

Darby, W. J., *et al.*, (1953), "The Vanderbilt Cooperative Study of Maternal and Infant Nutrition I, II, and III", *Journal of Nutrition* 51:539 20

Ebbs, J. H., F. F. Tisdall and W. A. Scott, (1941), "The Influence of Prenatal Diet on Mother and Child", *Journal of Nutrition* 22:515 18

Ebbs, J. H., F. F. Tisdall and W. A. Scott, (1942), "The Influence of Prenatal Diet on the Mother and Child", *G. Milbank Memorial Fund Quarterly* 20:35..13, 14

Garry, R. C., and D. Stiven, (1935-1936), "A Review of Recent Work on Dietary Requirements in Pregnancy and Lactation, with an Attempt to Assess Human Requirements", *Nutrition Abstract Review* 5:855 9

Habicht, J. P., C. Yarbrough, A. Lechtig, and R. E. Klein, (1974), "Relation of Maternal Supplementary Feeding During Pregnancy to Birth Weight and Other Sociobiological Factors", *Nutrition and Fetal Development* (M. Winick, editor) 22

Higgings, A. C., E. W. Crampton, and J. E. Moxley, (1972), "Nutrition and the Outcome of Pregnancy", Address to the IVth International Congress of Endocrinology, Symposium on Protein Malnutrition and Endocrine Systems (Washington, D.C., June, 1972) 22

Hoet, J. P., (1954), "Carbohydrate Metabolism during Pregnancy", *Diabetes* 3:1 20

Institute for Research on Poverty, University of Wisconsin, (1974), "Toward an Effective Income Support System: Problems, prospects, and choices" 22

Pages

Jeans, P. C., M. B. Smith, and G. Stearns, (1952), "Dietary Habits of Pregnant Women of Low Income in a Rural State", *Journal of the American Dietetic Association* 28:27 ..... 12, 21

National Academy of Sciences, Food and Research Board of the National Research Council, (1951), *Maternal Nutrition and Child Health*, Bulletin 123.... 17

National Academy of Sciences, Committee on Maternal Nutrition of the Food and Nutrition Board of the National Research Council, *Maternal Nutrition and the Course of Pregnancy*, (1970); *Summary Report* (1970) ..... passim

National Academy of Sciences, Food Research Board of the National Research Council, *Recommended Dietary Allowances*, 7th Edition (1968); 8th Edition (1974) 7

Naeye, R. L., and W. A. Blanc, (March 1970), "Fetal Famine May Kill More than We Think", *Medical World News* 11:15 16

Naeye, R. L., M. M. Diener, W. S. Dellinger, (1969), "Urban Poverty: Effects on Prenatal Nutrition", *Science* 166:1026 14

Peterkin, B., and F. Clark, (1969), "Money Value and Adequacy of Diets Compared with USDA Food Plans", *Family Economics Review* (ARS G2-5), Sept., 1969 21

Pitkin, Roy M., Harold A. Kamietsky, M. Newton, and J. A. Pritchard, (1972), "Maternal Nutrition: A Selective Review of Clinical Topics", *Journal of Obstetrics and Gynecology* 40:773 10

Pages

Primrose, T., and A. Higgins, (1971), "A Study in Human Anteparum Nutrition", *Journal of Reproductive Medicine* 7:257 22

Pyke, D. A."Diabetes Mellitus in Pregnancy," *Practitioner* 194:766 20

Scrimshaw, N. S., and J. E. Gordon (editors), (1968), *Malnutrition, Learning, and Behavior*, (MIT Press) 16

Silverman, W. A., and J. C. Sinclair, (1966), "Current Concepts: Infants of Low Birth Weight", *New England Journal of Medicine* 274:448 23

Smith, C. A., (1947), "Effects of Maternal Undernutrition upon the Newborn Infant in Holland, 1940-1945", *Journal of Pediatrics* 30:229 14

Toverud, G., (1950), "The Influence of Nutrition on the Course of Pregnancy", *G. Milbank Memorial Fund Quarterly* 28:7 9

U.S. Department of Agriculture, Agriculture Research Service, (1970), "Dietary Levels of Households in the U.S.", *Household Food Consumption Survey 1965-1966*, Report No. 6 21

U.S. Department of Agriculture, Agriculture Research Service, No. CA-62-19, "Family Food Plans Revised 1964" 22

U.S. Department of Agriculture, Economic Research Service, "Food Prices—Before and After Distribution of Welfare Checks . . . Low Income Areas, Seven Cities, 1969", (M.R.R. No. 907-1) 21

U.S. Department of Agriculture, Economic Research Service, (NFS-150) (Nov. 1974), *National Food Situation* 7

Pages

U.S. Department of Health, Education, and Welfare, Publication No. (SRS) 73-03100, NCSS Report A-2, "Public Assistance Characteristics" 22

U.S. Department of Health, Education, and Welfare, Publication No. (HSM) 72-8130-8134, *The Ten State Nutrition Survey, 1968-1970* 12, 22

U.S. Department of Labor, Bureau of Labor Statistics, (February 1969), "Retail Food Prices in Low and High Income Areas" 21

U.S. House of Representatives, Committee on Government Operations (Committee Print, July, 1969), "Economic Report on Food Chain Selling Practices in the District of Columbia and San Francisco, A Staff Report to the Federal Trade Commission" 21

U.S. House of Representatives, House Report No. 1851 (90th Congress, 2nd Session), "Consumer Problems of the Poor: Supermarket Operations in Low-Income Areas and the Federal Response" 21

U.S. Senate, Select Committee on Nutrition and Human Needs, (Committee Print, June, 1974), *National Nutrition Policy Study Report and Recommendation VIII* 7-9

Winick, Myron, (June 1971), "Cellular Growth During Early Malnutrition", *Pediatrics* 47:969 15

Winick, Myron, (May 1969), "Malnutrition and Brain Development", *Journal of Pediatrics* 74:678 25

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OCTOBER TERM, 1974

No. 73-1708

KEVIN J. BURNS, *Appellant*,

vs.

LINDA ALCALA, individually and on behalf of all other persons similarly situated, *Appellees*.

On Appeal from the United States Court of Appeals for the Eighth Circuit

Motion for Leave to File Brief Amici Curiae in Support of Appellees on Behalf of American Association for Maternal and Child Health, Childrens' Foundation, and Food Advocates

This motion for leave to file the annexed brief *amici curiae* is respectfully made pursuant to Rule 42 of this Court.

Consent to the filing of this brief has been granted by counsel for Appellees Alcala *et al.* Counsel for Appellant Burns has stated that "Iowa has no objection to [Food

Advocates] filing an amicus brief."[1] Counsel for Appellant Burns has not formally replied to American Association for Maternal and Child Health and Children's Foundation's request for consent.

Taking the cautious course, all Amici join in this motion for leave of Court.

The AMERICAN ASSOCIATION FOR MATERNAL AND CHILD HEALTH (AAMCH) is a non-profit corporation organized under the laws of the state of Illinois. It was founded over fifty-six years ago, in Chicago, by medical professionals concerned with maternal and fetal health, including nutrition.

Today, the AAMCH is a nationwide organization with a membership representing a broad spectrum of health and nutrition disciplines—obstetricians, gynecologists, pediatricians, nurses, hospital administrators, dietitians, nutritionists, medical paraprofessionals, and educators. It has a membership of over 3,500 with divisions organized in six states—Illinois, Ohio, West Virginia, Pennsylvania, Maryland, California—and the District of Columbia.

The nutritional status and needs of pregnant mothers and their unborn children has long been a focus of the AAMCH and has encompassed the early introduction of obstretrical standards for hospitals and regular discussion of and papers on maternal and fetal nutrition as a part of the AAMCH annual congresses.

THE CHILDREN'S FOUNDATION is a privately funded, non-profit, nationwide organization which provides technical assistance and information on issues affecting the

1. Consent of counsel for Appellees Alcala *et al.* has been communicated to the Clerk of the Court via telegram. Iowa's letter to counsel for amicus Food Advocates has been filed with the Clerk of the Court.

problems of childhood. Through its national office in Washington, D.C. and its many field representatives throughout the nation, the FOUNDATION attempts to achieve maximum utilization of existing social programs to assure adequate child, infant, and fetal nutrition. The FOUNDATION actively opposes any government action which, through impairment of the adequacy of nutrition, threatens the development of children's full capabilities.

FOOD ADVOCATES is a federally-funded resource and advocacy project within the Department of Nutritional Sciences, College of Natural Resources, University of California, Berkeley. FOOD ADVOCATES is funded through the Emergency Food and Medical Services program of the U.S. Office of Economic Opportunity, and undertakes research and legal action pertaining to the levels of nutrition provided under government social programs and the rights of recipients under those programs. FOOD ADVOCATES provides support, evaluation, and information to community action and legal services programs, as well as to other groups concerned with the problems of hunger, malnutrition, and undernutrition in the Western states.

The AMERICAN ASSOCIATION FOR MATERNAL AND CHILD HEALTH, CHILDREN'S FOUNDATION, and FOOD ADVOCATES support both the social policy and legal analysis reflected in the decision of the Circuit court below. Amici further believe that decision to be consonant both with the controlling precedents of this Court and the intentions of the Congress in creating the Aid to Families with Dependent Children (AFDC) program.

Amici believe that the survey of medical and nutritional literature made in their brief is highly relevant and necessary for this Court to be fully informed. Because of the special expertise of Amici regarding the nutritional needs

of and risks to the mother and unborn child during pregnancy and because Amici doubt that these matters would otherwise be briefed, they request that this motion to file the annexed brief *amici curiae* be granted.

Respectfully submited,

ROBERT M. TEETS, JR.
GEORGE R. MOSCONE
Attorneys for
Amici Curiae

December 18, 1974

In the Supreme Court of the United States

OCTOBER TERM, 1974

No. 73-1708

KEVIN J. BURNS,

Appellant,

vs.

LINDA ALCALA, individually and on behalf of all other persons similarly situated,

Appellees.

On Appeal from the United States Court of Appeals for the Eighth Circuit

Brief Amici Curiae in Support of Appellees Alcala, et al. of American Association for Maternal and Child Health, Childrens' Foundation, and Food Advocates

INTEREST OF THE AMICI

The interests of the Amici are set out in the preceding motion for leave to file this brief.

ARGUMENT

While Amici adopt and join in the legal argument of plaintiffs *Alcala et. al.* for affirmance, Amici additionally urge consideration of the highly relevant medical and nutritional evidence which follows.

Title IV of the Social Security Act of 1935 is widely recognized to have a dual focus—maintaining needy and dependent children and doing so within the context of a familial living unit.[1]

Amici argue that to exclude "unborn children" from the benefits of the Aid to Families with Dependent Children (AFDC) is to undermine both of these vital objectives. To fail to recognize an "unborn child" as a "dependent child" is to virtually program physiological and psychological hazard into the pregnancy and risk substantial infant morbidity as well as mortality. Congress can hardly be attributed to have elected to take so substantial a gamble with a portion of our future citizenry. Further, since restricted income leads to poor maternal nutrition as well as to poor fetal nutrition, exclusion of the "unborn child" from the AFDC grant risks the disability or even removal of the mother from the home and from other offspring. Such a risk then contravenes "the purpose of encouraging the care of dependent children in their own homes". Section 401 of Title IV of the Social Security Act of 1935 as amended, 42 U.S.C. section 601

I. Good Nutrition, Increased Food Consumption and Substantial Weight Gain Are Vital During Pregnancy.

Increased quantities of those nutrients essential to the maintenance of health in humans are required during pregnancy. The Food and Nutrition Board of the National Academy of Sciences—National Research Council regularly

1. e.g. Bell, W., *Aid to Dependent Children*, pp. 26-28 (Columbia Univ. Press, 1965).

publishes a list of *Recommended Daily Dietary Allowances* for nutrients including a table of the additional amounts of these nutrients required during pregnancy.[2]

In 1970 the Academy reiterated its recognition of the importance of nutrition during pregnancy in a report entitled *Maternal Nutrition and the Course of Pregnancy*[3]. The report summarizes existing significant research in this area and concludes:

> "Nutrition has an important role in reproductive performance. Epidemiological data strongly suggest that good preparation for pregnancy is based on a good health background and good nutritional status. To be well nourished from childhood and to maintain good diet during pregnancy would help to ensure safe, healthy pregnancies and healthy babies. To reach such an objective on a national scale has implications for policies that affect the availability of food, especially for families with inadequate food budgets;"[4]

The Academy's report has special implications for low-income pregnant women who because of the financial barriers posed by the spiraling rise[5] in the cost of food[6] have

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2. National Academy of Sciences, Food Research Board of the Nat'l Research Council, *Recommended Dietary Allowances*, 7th Edition (1968), 8th Edition (1974).

3. National Academy of Sciences, Committee on Maternal Nutrition of the Food and Nutrition Board of the National Research Council, *Maternal Nutrition and the Course of Pregnancy* (1970); *Summary Report* (1970).

4. Ibid, *Summary Report*, p. 15.

5. From January, 1973, through September, 1974, the retail cost of food for consumption at home rose 24.1%. *National Food Situation*, November, 1974, Table 15, page 37, USDA-Economic Research Service (NFS-150).

6. U.S. Senate, Select Committee on Nutrition & Human Needs, (Committee Print, June, 1974), *National Nutrition Policy Study Report & Recommendation VIII* pp. 15, 18-20:

> "[T]he disproportionately large share of food expenses in the budgets of poor people has caused the poor person's price index to advance faster than the regular consumer price

found it all but impossible to purchase an adequate food supply.

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index. The result is a disastrous decrease in the purchasing power of the poor. It also means that the poor have suffered far more grievously from the recent inflationary spiral than have the affluent and the middle class.

* * *

"Several alternative results will occur due to this extraordinary inflationary price squeeze on the poor. *If a poor family pays for non-food necessities first,* then the family will either be unable to purchase the same (already meager) diet that it obtained previously, or it will have to experience a substantial negative asset movement (i.e., the sale of assets or increased debt) in order to obtain its previous food quotient. *If a poor family pays for food necessities first,* then the family will be unable to pay for such crucial necessities as utilities, medical expenses, clothing and/or other items; in the alternative, in order to subsidize these other necessities, the family will experience a significant negative asset movement. In sum, the current inflationary food spiral has been most destructive to poor people's already vulnerable economic and nutritional status.

* * *

"Finally, in addition to the general across-the-board price increases in food, the poor experienced especially severe food price increases. This occurred because of the following: Although the elasticity of food demand is relatively low in comparison with other budget items, there nevertheless is *some* elasticity with most food items. All consumers tend to alter the composition of their food purchases in response to price increases. People tend to reduce both the quantity and quality of food purchased as prices increase. Thus, each income class, in attempting to maintain its food budget within its income capabilities, will try to shift to lower-cost, lower-quality foods in order to compensate for increased food costs. For the poor, however, who already are consuming generally the lowest cost and lowest quality food items, there is virtually no flexibility to switch to lower cost food items. Thus, they are unable to cushion the food price increases by switching to cheaper food items (as the more affluent are doing). Moreover, as the more affluent families 'spend down' to cheaper food items, the demand for such cheaper items increases and such food items tend to become further price-inflated.

* * *

"Evidence of this price increase differential is readily available. For example, poultry went up 144 percent (relative to its 1967 level) while beef went up only 75 percent; ham-

The risks associated with restriction and deprivation in total food intake were documented as early as the 1930's.[7] B. S. Burke related the nutritional quality of the diet of a group of pregnant women to the condition of their infants at birth and during the first two weeks of life. The maternal diets were rated as excellent, good, fair, or poor. A significant positive relationship was shown between the quality of the diet of the mother during the pregnancy and the group into which the infant was classified.[8] In addition, Burke reported a direct relationship between prenatal dietary rating and the course of pregnancy.[9] A positive relationship was also found between protein intake of the mother and the length, weight and general physical well-being of her infant. G. Toverud working in Oslo during the period 1939-1944 found that a group of pregnant women when given dietary supervision had a decrease in the incidence of maternal mortality and other complications, as well as stillbirth, prematurity, and neonatal deaths compared with the general population of the city.[10]

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burgers increased by 89 percent while sirloins increased by only 60 percent. Although the price of poultry rose faster than other meat products, poultry come to occupy a larger proportion of the protein input of the poor because it still was the cheapest source of meat protein. As a result, for many poor people the increases in prices were so high that they actually had to consume less of all products, particularly those vital to good health and productivity: protein products, dairy products, and some vegetables". (Emphasis in the original; footnotes omitted)

7. Garry, R. C., and D. Stiven, (1935-1936), "A Review of Recent Work on Dietary Requirements in Pregnancy and Lactation, with an Attempt to Assess Human Requirements", *Nutri. Abstr. Rev.*, 5:855.

8. Burke, B. S., V. A. Beal, S. B. Kirkwood, and H. C. Stuart, (1943), "The Influence of Nutrition upon the Condition of the Infant at Birth, *J. Nutr.* 26:569.

9. Burke, B. S., V. A. Beal, S. B. Kirkwood, and H. C. Stuart, (1943), "Nutrition Studies during Pregnancy", *Amer. J. Obstet. Gynecol.*, 46:38.

10. Toverud, G., (1950), "The Influence of Nutrition on the Course of Pregnancy", *G. Milbank Mem. Fund Quart*, 28:7.

A. INCREASED CALORIC AND PROTEIN INTAKE ARE NECESSARY

Specifically, an increase in caloric intake of approximately 10% over non-pregnant requirements is needed in normal pregnancy to permit the necessary adjustments in maternal physiology and provide for fetal development. This increase in calorie intake will allow for the recommended optimal total weight gain of 10 to 12 kg (22-27 lb). There is no justification for the routine restriction of weight gain to amounts less than the above because severe calorie restriction is potentially harmful to both mother and fetus. It impairs maternal ability to make the required physiologic adjustments of pregnancy, and appears to have an adverse effect on fetal growth and development during prenatal life and, perhaps, later as well.[11]

Studies have shown that there is an important interrelationship between calorie and protein intake. When calorie supply is sufficient to meet energy needs but protein intake is adequate, protein will be preferentially used to meet the body's basic energy requirements, creating a protein deficit. If inadequate amounts of protein are available for body-building functions, animal experiments have shown reduction in the number of offspring, the size of the young and their survival rate.[12] Subsequent growth of these animals is considerably inferior to that of animals with controlled, adequate diets.

In addition to these morphological sequelae of dietary restriction during pregnancy, other effects of perhaps greater

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11. Pitkin, Roy M., Harold A. Kamietsky, Michael Newton, and Jack A. Pritchard (1972), "Material Nutrition: A Selective Review of Clinical Topics", *Journal of Obstetrics and Gynecology*, 40:773.

12. Chow, B. F., and R. W. Sherwin, (1965), "Fetal Parasitism?", *Arch. Environ Health*, 10:395. See also—Chow, B. F. (1973), "Testimony on Maternal, Fetal, and Infant Nutrition", *Hearings Before The Select Committee on Nutrition and Human Needs, U.S. Senate* (Part 1—The Consequences Of Malnutrition), pp. 20-26.

significance have been described. Deficiencies in intellecutal functioning (as indicated by impaired maze-solving ability) and metabolic activities (reduced feed efficiency) of a permanent nature have been reported.[13] These observations can be explained by studies employing determinations of DNA as an index of cell number, and protein, and DNA ratio as an index of individual cell size. Since the development of organs and tissues involve sequential phases of division and growth, it is logical that restricting essential nutrients during cell division would have permanent effects.

Admittedly, the results of dietary restrictions on laboratory animals have not always yielded the same results when the same restrictions are placed upon human diets. For obvious ethical reasons, human experiments must be modified when run under controlled conditions. However, studies of the situation during World War II, when the diet of previously well-nourished women was affected by general food scarcity, to a large extent paralleled results of these tests on rats, and have given researchers increased confidence in the data generated from experiments using rats.

Finally, research in animals suggests that the effects of nutritional deprivation during pregnancy are perpetuated beyond the immediate following generation. Cowley & Griesel noted that when female rats were placed on a nutritionally inadequate diet during pregnancy and lactation and when their female offspring also were placed on an inadequate diet, even though the third generation offspring were placed on a normal diet during gestation, their offspring were found to be intellectually deficient.[14]

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13. Caldwell, D. F., and J. A. Churchill, (1967), "Learning Ability in the Progeny Of Rats Administered a Protein-Deficient Diet during the Second Half of Gestation", *Neurology*, 17:95.

14. Cowley, J. J., and R. D. Griesel, (1966), "The Effect on Growth and Behavior of Rehabilitating First and Second Generation Low Protein Rats", *Anim. Behav.* 14:506.

There is, then, a basis for a strong scientific inference that a similar effect occurs in humans when there is insufficent income to guarantee a nutritionally adequate diet.

B. INCREASED VITAMIN AND MINERAL INTAKE ARE NECESSARY

Animal experiments have indicated that various vitamin deficiencies have an adverse effect upon the outcome of pregnancy. While vitamin deficiency is rare among upper-middle class Americans, studies have shown that selected deficiencies do exist in poorer Americans whether they live in urban or rural areas.[15]

Although vitamin and mineral supplementation has been routinely prescribed by physicians, the National Academy of Sciences considers such supplementation to be of doubtful value, and further states that "vitamin and mineral preparations should not be regarded as correctives for improper food habits. Their costs, relative to the cost of enhancing the nutrient intake with foods, should be taken into account, especially in dealing with women who are living on low incomes."[16]

Iron is the exception to this prohibition. Recognizing that most women do not have sufficient iron stores to meet the needs of pregnancy and that an adequate supply of iron from the diet cannot be easily obtained, the Academy recommends supplementation during the second and third trimesters of pregnancy.[17]

Although doctors believe that a history of good nutrition is desirable, a study by Ebbs has shown that improving the

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15. Jeans, P. C., M. B. Smith, and G. Stearns, (1952), "Dietary Habits of Pregnant Women of Low Income in a Rural State", *J. Amer. Diet. Assn.* 28:27. See also DHEW, *Ten-State Nutrition Survey*, 1968-1970, (HSM-72-8130-8134).

16. "*Maternal Nutrition and the Course of Pregnancy*, *op cit* note 3, at 103.

17. *Ibid.*

diet during pregnancy may be sufficient to deliver a healthy infant. Pregnant women were divided into three groups. The first group had a history of poor diets but was supplemented during the last 4 months of pregnancy. Those in the second group had a moderately good diet while those in a third group had poor diets and served as controls. During the course of pregnancy the first and second groups enjoyed better health and their offspring were healthier than those of the third group. No differences were detected between the women with a history of good diet and those with a history of poor diet who received supplementation during pregnancy.[18]

II. The Adverse Effects for the Infant of Poor Maternal Nutrition.

Research has determined four general adverse effects on the infant of poor maternal nutrition: low birth weight, stillbirths, premature births, and anemia.

A. THE RISK OF LOW-BIRTH WEIGHT

Probably the most severe effect of poor maternal nutrition is a decrease in the infant's weight at birth, since low birth weight brings with it increased chances of neonatal fatalities and may also result in irreversable brain damage. The incidence of low-birth-weight infants has been linked to socioeconomic status, low material weight gain, poor nutrition and lack of proper medical attention during pregnancy.[19]

The relationship between poor nutrition and low birth weight was demonstrated during World War II. General

18. Ebbs, J. H., F. F. Tisdall, and W. A. Scott, (1942), "The Influence of Prenatal Diet on the Mother and Child", *G. Milbank Mem. Fund Quart*, 20:35.

19. "*Maternal Nutrition & The Course of Pregnancy-Summary Report, op cit* note 3, at 14.

nutrition was poor in countries that had previously enjoyed an adequate food supply and researchers found that birth weight decreased. In Holland, Smith found a decrease of about 10% in average birth weights during 1944.[20] In Leningrad, Antonov also found a marked increase in the incidence of low birth weight infants and a 31% increase in mortality during the neonatal period.[21]

Ebbs has demonstrated that both the increased possibility of neonatal fatalities and the effects of low birth weight may be impossible to reverse. In a review at six months of age of infants whose diets had been controlled, he found that weights of infants born of mothers who had received supplemented diets during pregnancy were higher than weights of infants born of mothers who had an unsupplemented poor diet during pregnancy.[22]

Low birth weight and perinatal death are much more common in families of low socioeconomic status than in families that are better off. We now identify under-nutrition as the cause of low birth weight in a group of infants born of poor urban mothers.[23]

B. THE RISKS OF MENTAL RETARDATION AND PSYCHOLOGICAL IMPAIRMENT

Perhaps the most disturbing results of tests run on low birth weight infants are those which link low birth weight with subsequent retardation. Birch, surveying the research to date, asserts that low-birth weight children are consid-

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20. Smith, C. A. (1947) "Effects of Maternal Undernutrition upon the Newborn Infant in Holland (1940-1945)." *J. Pediat.* 30:229.

21. Antonov, A. N. (1947) "Children Born during the Seige of Leningrad in 1942". *J. Pediat.* 30:250.

22. Ebbs, J. H. *et al., op cit.*, note 18.

23. Naeye, R. L., M. M. Diener, W. S. Dellinger, (1969) "Urban Poverty: Effects on Prenatal Nutrition", *Science* 166:1026.

erably over-represented among the mentally subnormal.[24] Defects have been found in the number and size of brain cells and the extent of brain mylenation.[25] Development of enzyme systems associated with brain lipid formation has been shown to depend upon adequate uterine growth. Moreover, when development of the nervous system is impaired at a critical time in utero, full recovery is not possible by later nutritional intervention no matter how zealously attempted. Among very low birth weight infants, there is an increased incidence of epilepsy, cerebral palsy, and severe mental retardation. Retrospective data on several groups of low birth weight children have shown generally lower scores on standard mental and psychological tests. Moreover test scores show a progressive decrease with decreasing birth weights, with low-birth weight children tending to achieve lower scores both in the pre-school years and at school age.

The neurological deficits which are a result of low birth weight would, when one applied generally accepted psychiatric theories, be associated with perception, perceptual-motor integration, abstract reasoning and short attention span impairments. This hypothesis when tested revealed a correlation between low birth weight and impairment on five of the six measures of IQ. Moreover, abstract verbal reasoning and perceptual-motor integration impairments were most marked in low birth weight children. In addition, low birth weight children have also been found by virtually

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24. Birch, H. G., (1971), "Functional Effects of Fetal Malnutrition", *Hospital Practice*, 134:147; see also Butler, N. (1974), "Late Postnatal Consequences of Fetal Malnutrition", *Nutrition & Fetal Development*, (M. Winick, editor), p. 173.

25. Winick, Myron, (June 1971) "Cellular Growth During Early Malnutrition", *Pediatrics* 47:969.

all investigators to suffer more personality disturbances than do children of normal birth weights.[26]

C. THE RISK OF STILLBIRTH

Studies have demonstrated a strong correlation between stillbirths and poor maternal nutrition.[27] Cameron and Graham demonstrated that mothers with full-term infants had better diets than did mothers of stillborn infants.[28] Antonov, using the data on children born during the Siege of Leningrad, found a doubling of the stillbirth rate.[29]

Similarly, for a decade preceding 1939 the fetal mortality rate and the stillbirth rate in the United Kingdom were relatively stationary. However, a rapid decline occurred between 1940 and 1945 when food was scarce. Because of this food shortage the government initiated a food rationing program which gave priority to pregnant women. The result of the program was that lower class women were actually receiving a better diet than they would have received before the war and this accounts for the decrease in the stillbirth rate. These findings were confirmed by

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26. See generally Scrimshaw, N. S., and J. E. Gordon (editors), *Malnutrition, learning, and behavior,* (M.I.T. Press, 1968). See also Cravioto, J. L. Hambraeus, and B. Vahlquist (editors), *Early Malnutrition and Mental Development,* (Swedish Nutrition Foundation, 1974).

27. Autopsies performed on American 469 infants lead researchers to conclude, "to be born poor proved a blight. The underprivileged group weighed 12% to 16% less than their correlatives. And practically every vital organ was underweight. Heart, liver, kidneys, thymus, adrenals, and spleen, all were stunted." Further, histological studies revealed reduced cytoplasm in the cells of poor infants, reduced subcutaneous fat in the abdominal wall; and inferior skeletal muscle development. Naeye, R. L. and W. A. Blanc, (March 1970) "Fetal Famine May Kill More than We Think", *Medical World News* 11:15.

28. Cameron, C. S. and S. Graham, (1944) "Antenatal Diet & Its Influence on Stillbirths & Prematurity", *Glasgow Med. J.* 24:1.

29. Antonov, A. N. *op cit.* note 21.

Balfour[30] in a study of nearly 20,000 pregnancies, which found a significant reduction in the stillbirth rate, as well as in the neonatal mortality rate, among women whose diets were adequately supplemented.

D. THE RISKS OF INFANT MORTALITY

Premature birth is a principle cause of infant mortality. The National Research Council in 1950, surveyed the research and found:

> "Investigations have confirmed that prematurity is attributable to a combination of various factors including those of nutritional, mental, or social character, which influence the general well-being of the mother. By studying the growth of the fetus and investigating the full nutritive requirement of the mother and fetus, the problem of prematurity will be solved and fetal and neonatal infant mortality and morbidity will be lowered. The constant improvement in the care of these infants is a contribution to pediatric knowledge, but it is the prevention of their premature delivery which must be the ultimate objective. If a positive result is to be gained in reduction of premature births, attention must be paid to the environmental stresses, as well as to the nutritional status of pregnant women. Social and financial security are of the greatest importance in this connection. The better the care of pregnant women, the lower the stillbirth, premature birth, and neonatal mortality rates, and the better the general health of newborn infants."[31]

E. THE RISKS OF ANEMIA

Postnatal anemia is suspected to be related to fetal nourishment during gestation. The iron content of the infant

30. Balfour, M. J. (1944), "Supplementary Feeding in Pregnancy", *Lancet* 1:208.

31. National Academy of Sciences, Food & Research Board of the National Research Council, (1951), *Maternal Nutrition & Child Health*, Bulletin 123, pp. 130-131.

at birth depends upon the maternal iron intake during pregnancy. If iron intake was inadequate, the infant will have insufficient iron reserves in his body.[32]

Because milk and other infant foods are generally poor dietary sources of iron, the infant is dependent upon its iron reserves until such time as its diet can be expanded to include iron rich foods. Cautley maintains that this lack of iron in the fetal tissues is the essential cause of anemia during infancy.[33]

III. The Adverse Effects of Poor Nutrition for the Pregnant Mother.

Thus the results of extensive research demonstrates the importance of an adequate diet for the mother during pregnancy to increase the probability of a healthy infant. But other studies show that good nutrition during pregnancy also is important in lessening the burden on the mother's body, improving her health during pregnancy, and decreasing the incidence of maternal mortality and morbidity.

A. THE RISK OF MATERNAL MORTALITY

The Ebbs study[34] compared three groups of pregnant women: those with a history of poor diet who during the last four months altered their diets to the recommended standard; those with a history of moderately good diet, and those with a history of poor diets. During the entire course of pregnancy, the mothers in the first two groups enjoyed better health, had fewer complications and were better obstetrical risks than those left on the poor diet.

32. Maternal Nutrition and Child Health, op cit, note 31, at 92.

33. Cautley, E., (1940), "Simple Infantile Anemia," *Clin. J.* (London) 36:325.

34. Ebbs, J. H., F. F. Tisdall, and W. A. Scott, (1941), "The Influence of Prenatal Diet On Mother And Child," *J. Nutr.*, 22:515.

The most serious effect of poor nutrition upon the mother is the tendency that it has to increase the mortality rates of women during childbirth. Although it is difficult to isolate poor nutrition from inadequate hygiene and medical care, which are generally linked, the National Research Council has urged that a greater emphasis be put on nutrition during pregnancy to further decrease maternal mortality. While the number of women dying in childbirth in the U.S. has been reduced to under a thousand (1967), studies by maternal mortality committees indicate that at least half of these deaths are preventable.[35]

Toxemia is the most frequent cause of maternal deaths in the United States. Incidence of toxemia appears to be related to income level and other environmental factors rather than to genetic factors. Counting the District of Columbia as a state and dividing the states into three groups according to per capita income, mortality rates for toxemias of pregnancy were as follows:

MORTALITY RATE BY INCOME GROUP[36]

Income Group	Mortality Group (%)
High	3.8
Middle	5.9
Low	11.9

The rate for middle income group is close to the national average of 6.2%. This data suggests a strong correlation between toxemias of pregnancy and income.

Around the turn of the century it was believed that a restricted diet reduced the chances of toxemia. This idea has since been rejected in favor of an emphasis on an increase in protein in the diet as being the most important

35. *Maternal Nutrition and The Course Of Pregnancy, op cit* note 3, at 184.

36. *Ibid*, at p. 165.

factor in decreasing the incidence of toxemia.[37] Statistics supporting this more recent practice show that where undernutrition still exists, toxemia remains a danger to pregnant women.

B. THE RISK OF MATERNAL MORBIDITY

The long-term effects of pregnancy complications on women who survive childbirth include varicose veins, chronic problems of the genito-urinary tract (particularly the lower tract), and pelvic floor relaxations. These complications if existing prior to pregnancy are aggravated. Further, short-interval pregnancies are known to deplete a malnourished mother of calcium and iron stores and may contribute to the development of iron deficiency anemia. Anemias and other consequences of undernutrition combine with infections and chronic illness to increase maternal morbidity and mortality.[38]

An increased incidence of diabetes following pregnancy is also thought to result from poor maternal nutrition during pregnancy.[39]

These complications are more frequent in low-income mothers than in women of other income groups.[40]

IV. Inadequate Income Contributes to Poor Food Habits and Inadequate Nutrition.

Studies of the nutrition of indigent women in urban areas[41] and of rural pregnant women of low-income have

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37. *Maternal Nutrition And The Course of Pregnancy, op cit* note 3, at p. 176.

38. *Ibid* at 7.

39. Hoet, J. P., (1954), "Carbohydrate Metabolism during Pregnancy", *Diabetes*, 3:1; Pyke, D. A., "Diabetes Mellitus in Pregnancy", *Practitioner*, 194:766.

40. "Principle Causes of Maternal Mortality, 1957-1962" (1964), *Calif. Med.*, 100:412.

41. Darby, W. J., *et al.*, (1953), "The Vanderbilt Cooperative Study of Maternal and Infant Nutrition I, II, and III", *J. Nutr.*, 51:539.

shown that their diets are inadequate.[42] Additionally, most low-income women have a history of poor dietary habits, dating back to childhood, often resulting from the family's inability to purchase a wide variety of foods.

Although USDA studies have shown that low-income households spend their food dollars more efficiently (i.e. more nutrition is purchased per dollar) than any other income group,[43] their studies have also shown that the less money a family has to spend on food, the more likely that the diet will be deficient in one or more nutrients, even when reasonable selections are being made from each of the "Basic Four"[44] food groups.[45]

The food purchasing power of the limited economic resources of the poor is further diluted by the artificially inflated food pricing practices endemic in low-income areas. Several governmental studies in the late 1960's confirmed that the private sector's food distribution system "performs less satisfactorily in the low-income areas of our major cities than in suburban areas."[46]

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42. Jeans, P. C., *op cit.*, note 15.

43. USDA, Agriculture Research Service, (1970), "Dietary Levels of Households in the U.S.", *Household Food Consumption Survey 1965-66*, Report No. 6, at 6.

44. The "Basic Four" is a simplified concept of good nutrition which divides all food into one of four groups: dairy products, bread and cereal products, fruits and vegetables, and protein foods.

45. Peterkin, B. and F. Clark, (1969), "Money Value and Adequacy of Diets Compared with USDA Food Plans", *Family Economics Review* (ARS G2-5), September, 1969, pp. 6-8.

46. U.S. House of Representatives, Committee on Government Operations (Committee Print, July, 1969), "Economic Report On Food Chain Selling Practices In The District Of Columbia And San Francisco, A Staff Report to the Federal Trade Commission", p. 3. See also: House Report No. 1851 (90th Cong., 2nd Sess.), "Consumer Problems of the Poor: Supermarket Operations in Low-Income Areas and the Federal Response"; Dept. of Labor, Bureau of Labor Statistics, (February, 1969), "Retail Food Prices in Low and High Income Areas"; Dept. of Agriculture, Economic Research Service, "Food Prices—Before and After Distribution of Welfare Checks . . . Low Income Areas, Seven Cities, 1969" (M.R.R. No. 907-1).

While studies show that improved diet during pregnancy can compensate for the mother's prior undernutrition and malnutrition, and can substantially increase the infant's birth weight,[47] because of low AFDC grant levels[48] and the

47. Habicht, J. P., C. Yarbrough, A. Lechtig, and R. E. Klein, (1974), "Relation of Maternal Supplementary Feeding During Pregnancy to Birth Weight and Other Sociobiological Factors", *Nutrition And Fetal Development* (M. Winick, editor), p. 127. See also Higgins, A. C., E. W. Crampton, and J. E. Moxley (1972), "Nutrition and the Outcome of Pregnancy", Address to the IVth International Congress of Endocrinology, Symposium on Protein Malnutrition and Endocrine Systems (Washington, D.C., June, 1972); Primrose, T. and A. Higgins (1971), "A Study in Human Antepartum Nutrition", *J. Reproduct. Med.* 7:257.

48. The present low AFDC grant levels across the nation virtually guarantee that pregnant AFDC mothers will be unable to secure adequate nutrition for themselves and their unborn children. This may be readily demonstrated by a comparison between USDA's low cost food plan and DHEW's AFDC grant level data. USDA's "basic low cost food plan is the plan most often used by social welfare and public health agencies for calculating allotments and planning family food budgets." USDA, Agriculture Research Service No. CA-62-19, "Family Food Plans Revised 1964", p. 2.

In June, 1974, the cost of USDA's low cost food plan for a household of a pregnant mother, a boy (9-12 years), and a girl (9-12 years) was $149.10 per month.

Yet DHEW data for April, 1974, finds nineteen states with average family AFDC grants less than the monthly cost of USDA's low cost food plan. DHEW Publication No. (SRS) 75-03100, NCSS Report A-2, "Public Assistance Characteristics", Table 4. Those nineteen states are—Alabama, Arizona, Arkansas, Delaware, Florida, Georgia, Indiana, Kentucky, Louisiana, Maine, Mississippi, Missouri, Montana, New Mexico, North Carolina, South Carolina, Tennessee, Texas, and West Virginia. See also, Institute for Research on Poverty, University of Wisconsin, (1974), "Toward an Effective Income Support System: Problems prospects, and choices", pp. 97-100. Thus it is not surprising that DHEW has found increased evidence of widespread malnutrition and substantiated the clear link between malnutrition, poverty, and social and cultural disadvantage. Their study results further reveal a particularly low protein intake among low-income pregnant women and an associated incidence of low birth weights among their offspring. *The Ten-State Nutrition Survey, 1968-1970.* U.S. Department of Health, Education & Welfare, publication Nos. (HSM) 72-8130-8134.

especially severe effects of inflation on the food purchasing power of AFDC households, AFDC mothers face nearly insurmountable barriers to the meeting of their nutritional needs during pregnancy. Thus to reduce the morbidity and mortality risks to both the low-income mother and her unborn child, prenatal diets must include sufficient nutrients to provide for past nutritional deficiencies as well as the current needs of the pregnancy.

V. The Economic and Social Risk if Unborn Children Are Denied Aid to Families with Dependent Children Entitlements.

The Subcommittee on Nutrition and Human Needs of the California State Senate, in hearings to investigate the effects of grant cuts to AFDC mothers, heard testimony about the immediate postnatal costs of caring for infants born to low-income, poorly nourished mothers. Dr. William Silverman, a well-known neonatologist, testified that such babies:

> "must remain in the hospital for long periods of time, for management of his problems of being born prematurely, or being underweight . . . the acute costs are tremendous . . . but if it is the overall lifetime cost when we are talking about retardation, I have no idea exactly . . . it's many, many times that of the normal healthy, bouncing, middle-class child."[49]

Dr. Silverman's estimate of the cost of immediate postnatal care for such children was "$150 to $200 per day, times two weeks, three weeks, four weeks, you get some rough estimate of what we are doing".[50] Later Dr. Walter

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49. "Hearings: AFDC Grant Cuts to Pregnant Women, October 4, 10, 26 and November 29, 1972", Subcommittee on Nutrition and Human Needs, California State Senate, Health & Welfare Committee at page 35.

50. Ibid, at page 35 and see also Silverman, W. A. & J. C. Sinclair, (1966) "Current Concepts: Infants of Low Birth Weight", *New England Journal of Medicine*, 274:448.

M. Ballard, Chief of the Maternal Health and Family Planning Unit in the Bureau of Maternal and Child Health of the California State Department of Public Health and a specialist in obstetrics and gynecology, testified with respect to Dr. Silverman's estimate that:

> "If anything, it seems to me to be an understatement of that problem. I was in private practice up to about five years ago, before I came into the public health field, and some of my patients who had premature babies had a fantastic hospital bill, because their babies were in the hospital upwards of a month or two months depending upon prematurity, how severely underweight they were at birth and how well they managed to take nourishment, etc."[51]

Dr. Silverman and Ballard thus estimate the immediate cost of caring for newborns suffering the debilitating effects of poor prenatal nutrition to be $2200 to $5600 and more in hospital expenses alone.

The cost of caring for children of poorly nourished mothers does not consider the additional expense of maternal complications, the incidence of which, as noted previously, bears a direct relationship to income and nutrition during pregnancy. Nor do these costs consider the additional costs which arise from the fact that children born of high-risk pregnancies throughout their childhoods have increased susceptibility to infections, illness and disability.

Finally, and perhaps most expensive are the increased costs of education for children who, because of complications during pregnancy, suffer either mild or severe forms of mental retardation. The economic costs are twofold: increased costs of special education, and the likelihood of the child's increased dependence upon society for assist-

51. Ibid, at page 76.

ance in adulthood because of the increased likelihood of poverty.[52]

> "[I]n terms of over-all cost it would certainly be more efficient to use the available funds to . . . prevent the exceedingly costly consequences of maintaining within the society large numbers of individuals who are unable to contribute because of marginal mental development."[53]

VI. Conclusion.

For the reasons stated above, the judgment of the Court of Appeals for the Eighth Circuit, should be affirmed.

Respectfully submitted,

ROBERT M. TEETS, JR.
GEORGE R. MOSCONE
Attorneys for Amici

December 18, 1974

Of Counsel:
AUDREY TITTLE CROSS

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52. See generally The California State Assembly Committee on Health and Welfare, *Malnutrition: One Key to the Poverty Cycle,* January 12, 1970.

As the Report concludes, however, the ultimate cost may never be measurable in purely economic terms.

"*[E]ven the most sophisticated and expensive compensatory education cannot restore a poor child's ability to compete intellectually on equally terms if that child's potential for intellectual development has been irreversibly impaired by malnutrition.*" Emphasis in original, page 3.

53. Winick, Myron, (May 1969) "Malnutrition and Brain Development" *Journal of Pediatrics,* 74: 678.